

What is claimed is:

1. An ion source (50) for an ion implanter, comprising:
- (i) a sublimator (52) having a cavity (66) for receiving a source material (68) to be sublimated and for sublimating the source material;
 - (ii) a gas injector (104) for injecting gas into said cavity (66);
 - (iii) an ionization chamber (58) for ionizing the sublimated source material, said ionization chamber located remotely from said sublimator; and
 - (iv) a feed tube (62) for connecting said sublimator (52) to said ionization chamber (58).
2. The ion source (50) of claim 1, further comprising a heating medium (70) for heating at least a portion of said sublimator (52) and said feed tube (62), and a control mechanism for controlling the temperature of said heating medium (70).
3. The ion source (50) of claim 2, wherein said control mechanism comprises a heating element (80) for heating the heating medium (70), a pump (55) for circulating said heating medium, at least one thermocouple (92) for providing temperature feedback from said heating medium (70), and a controller (56) responsive to said temperature feedback to output a first control signal (94) to said heating element.
4. The ion source (50) of claim 2, wherein said gas is helium.
5. The ion source (50) of claim 2, wherein said gas is hydrogen.
6. The ion source (50) of claim 2, wherein said source material is a

molecular solid having a vapor pressure of between 10^{-2} Torr and 10^3 Torr and a sublimation temperature of between 20° C and 150° C.

7. The ion source (50) of claim 6, wherein said source material is decaborane.

8. The ion source (50) of claim 7, wherein said gas improves the heat transferability between walls (64) of the sublimator (52) and the source material (68).

9. A vaporizer for an ion source (50), comprising:

- (i) a crucible (52) having a cavity (66) for receiving a source material (68) to be vaporized and for vaporizing the source material;
- (ii) a gas injector (104) for injecting gas into said cavity (66);
- (iii) a feed tube (62) for connecting said vaporizer (52) to a remotely located ionization chamber in which vaporized source material may be ionized; and
- (iv) a heating medium (70) for heating at least a portion of said vaporizer (52) and said feed tube (62).

10. The vaporizer of claim 9, further comprising a control mechanism for controlling the temperature of said heating medium (70).

11. The vaporizer of claim 10, wherein said control mechanism comprises a heating element (80) for heating the heating medium (70), a pump (55) for circulating said heating medium, at least one thermocouple (92) for providing temperature feedback from said heating medium (70), and a controller (56) responsive to said temperature feedback to output a first control signal (94) to said heating element.

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12. The vaporizer of claim 10, wherein said gas is helium.
13. The vaporizer of claim 10, wherein said gas is hydrogen.
14. The vaporizer of claim 10, wherein said source material is a molecular solid having a vapor pressure of between 10^{-2} Torr and 10^3 Torr and a sublimation temperature of between 20° C and 150° C.
15. The vaporizer of claim 14, wherein said source material is decaborane.
16. The vaporizer of claim 15, wherein said gas improves the heat transferability between walls (64) of the crucible (52) and the source material (68).
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